

AMENDMENTS TO THE CLAIMS

Please Claims 1 and 5 as follows. Insertions are shown underlined while deletions are ~~struck through~~. Please cancel Claims 2 and 6. Please add Claims 9 and 10.

1 (currently amended): A reformer for obtaining a synthesis gas by partially oxidizing a carbon-containing raw gaseous material and then steam-reforming the oxidized raw material, the reformer comprising:

a single reactor vessel including (i) a catalyst layer for promoting a steam reforming reaction and a shift reaction, and (ii) a partial oxidation part disposed upstream of the catalyst layer for carrying out a partial oxidation reaction,

an oxidizing agent feed pipe for feeding an oxidizing agent into the vessel upstream of the catalyst, said oxidizing agent feed pipe being disposed coaxially with the vessel, and

a carbon-containing gaseous raw material feed pipe for feeding the carbon-containing gaseous raw material into the vessel, said carbon-containing gaseous raw material feed pipe and said oxidizing agent feed pipe axially intersecting with each other at an angle of 80 to 100° upstream of the catalyst layer, said pipes separately opening into the vessel,

wherein the central axis of the oxidizing agent feed pipe and the central axis of the carbon-containing gaseous raw material feed pipe intersect with each other downstream of the outlet of the oxidizing agent feed pipe in an oxidizing agent flowing direction and downstream of the outlet of the carbon-containing gaseous raw material feed pipe in a carbon-containing gaseous raw material flowing direction.

2 (canceled)

3 (previously presented): The reformer according to Claim 1, wherein the following relationships are satisfied:

$$40 \leq V1 \leq 150 ;$$

$$0.2V1 \leq V2 \leq 0.8V1 ; \text{ and}$$

$$\min(0.5D2, 7.0D1) \leq L1 \leq \max(0.5D2, 7.0D1),$$

wherein D1 (m) is an equivalent hydraulic diameter of the outlet of the oxidizing agent feed pipe,

D2 (m) is an equivalent hydraulic diameter of the outlet of the carbon-containing gaseous raw material feed pipe,

V1 (m/sec) is an average flow velocity of oxidizing agent jet at the outlet of the oxidizing agent feed pipe,

V2 (m/sec) is an average flow velocity of carbon-containing gaseous raw material jet at the outlet of the carbon-containing gaseous raw material feed pipe, and

L1 (m) is a distance from the outlet-end of the oxidizing agent feed pipe to an intersection point where the central axis of the oxidizing agent feed pipe and the central axis of the carbon-containing gaseous raw material feed pipe intersect with each other.

4 (original): The reformer according to Claim 1, wherein the cross section of the outlet of the oxidizing agent feed pipe has a circular, oval, polygonal, starry or petal shape.

5 (currently amended): A method for obtaining a synthesis gas comprising:

feeding an oxidizing agent in an oxidizing agent flowing direction into a partial oxidation part of a reaction vessel where a partial oxidation reaction is carried out, said oxidizing agent flowing direction being aligned with a central axis of the partial oxidation part;

feeding a carbon-containing gaseous raw material in a carbon-containing gaseous raw material flowing direction into the vessel separately from the oxidizing agent to partially oxidize the carbon-containing raw material,

wherein the oxidizing agent flowing direction and the carbon-containing gaseous raw material flowing direction intersect with each other at an angle of 80 to 100° inside the vessel to contact the oxidizing agent and the carbon-containing gaseous raw material; and

after the partial oxidation reaction, steam-reforming the oxidized raw material in the vessel in the presence of a catalyst for promoting a steam reforming reaction and a shift reaction, said catalyst being disposed downstream of the intersection point of the oxidizing agent flowing direction and the carbon-containing gaseous raw material flowing direction.

6 (canceled)

7 (currently amended): The method according to Claim 5, wherein the oxidizing agent is fed through an oxidizing agent feed pipe, and the carbon-containing gaseous raw material is fed

through a carbon-containing gaseous raw material feed pipe, wherein the following relationships are satisfied:

$$40 \leq V1 \leq 150 ;$$

$$0.2V1 \leq V2 \leq 0.8V1 ; \text{ and}$$

$$\min(0.5D2, 7.0D1) \leq L1 \leq \max(0.5D2, 7.0D1),$$

wherein D1 (m) is an equivalent hydraulic diameter of an outlet of the oxidizing agent feed pipe,

D2 (m) is an equivalent hydraulic diameter of an outlet of the carbon-containing gaseous raw material feed pipe,

V1 (m/sec) is an average flow velocity of oxidizing agent jet at the outlet of the oxidizing agent feed pipe,

V2 (m/sec) is an average flow velocity of carbon-containing gaseous raw material jet at the outlet of the carbon-containing gaseous raw material feed pipe, and

L1 (m) is a distance from an end of the outlet of the oxidizing agent feed pipe to an intersection point where a central axis of the oxidizing agent feed pipe and a central axis of the carbon-containing gaseous raw material feed pipe intersect with each other.

8 (previously presented): The method according to Claim 7, wherein the cross section of the outlet of the oxidizing agent feed pipe has a circular, oval, polygonal, starry or petal shape.

9 (new): The reformer according to Claim 1, wherein the oxidizing agent feed pipe is the only pipe for feeding the oxidizing agent into the vessel, and the carbon-containing gaseous raw material feed pipe is the only pipe for feeding the carbon-containing gaseous raw material into the vessel.

10 (new): The method according to Claim 5, wherein the oxidizing agent is fed only into the partial oxidation part of the vessel, and the carbon-containing gaseous raw material is fed only into partial oxidation part of the vessel.